

**CLAIMS**

1. A triceps dip exercise machine, comprising:

- 2           a main frame having a user support pivot mount, a forward end,  
and a rear end;
- 4           a user support pivotally mounted on the user support pivot mount  
for supporting a user in a seated position and movable between a start  
6           position and an end position at a different angle from the start position;  
            an exercise arm movably mounted on the frame, the exercise arm  
8           having handles for gripping by a user in performing a triceps dip exercise  
and the exercise arm being movable between a start position and an end  
10          position;
- a connecting linkage connecting movement of the exercise arm to  
12          movement of the user support, whereby movement of the exercise arm  
from the start to the end position simultaneously rotates the user support  
14          from the start to the end position; and  
            a load for resisting movement of at least one of the moving parts of  
16          the machine;
- whereby the combined motion of the user support frame and  
18          exercise arm between the start and end position substantially replicates  
the natural movement of the human body when performing a free bar  
20          triceps dip exercise.

2. The machine as claimed in claim 1, wherein the end position of the  
2          user support is reclined relative to the start position.

4          3. The machine as claimed in claim 1, wherein the start position of the  
user support is a forwardly inclined position.

- 6 4. The machine as claimed in claim 1, wherein the end position of the  
user support is a rearwardly reclined position.
- 2 5. The machine as claimed in claim 1, wherein the user support has a seat  
pad and a back pad fixed in position relative to one another throughout  
the exercise movement.
- 2 6. The machine as claimed in claim 5, wherein the back pad is at a  
forward inclination of approximately 10 to 15 degrees to the vertical in  
the start position.
- 2 7. The machine as claimed in claim 6, wherein the back pad is at a  
rearwardly reclined angle in the end position.
- 2 8. The machine as claimed in claim 7, wherein the rearwardly reclined  
angle is in the range of 8 to 12 degrees to the vertical in the end position  
of the user support.
- 2 9. The machine as claimed in claim 5, wherein the user support further  
includes a foot plate for supporting the user's feet in a fixed position on  
the user support throughout the exercise movement.
- 2 10. The machine as claimed in claim 1, including a stationary foot rest  
mounted on the main frame in front of the user support for supporting the  
user's feet during an exercise movement.
- 2 11. The machine as claimed in claim 1, wherein the exercise arm is  
moveably mounted on the frame for rotation about an exercise arm pivot.

12. The machine as claimed in claim 11, wherein the exercise arm pivot is  
2 positioned rearward of the user support.

13. The machine as claimed in claim 1, wherein the exercise arm is  
2 moveably mounted on the frame for movement in a linear path.

14. The machine as claimed in claim 1, wherein the start positions of the  
2 exercise arm and user support place the handles on opposite sides of the  
user's body, under the shoulder and adjacent the side centerline of the  
4 body, and the end positions of the exercise arm and user support place  
the handles in line with the user's side centerline and slightly below the  
6 user's hips, whereby the user starts the exercise with their elbows bent  
and their hands gripping the handles slightly below their shoulders, and  
8 finishes the exercise with their arms extending straight down on opposite  
sides of their body and in line with the side centerline of their body.

15. The machine as claimed in claim 1, wherein the user support pivot  
2 mount is positioned at a predetermined location under the user support  
frame and beneath the user's body when supported on the frame, the  
4 pivot mount defining a vertical, gravitational center line, whereby  
movement of the user engagement device in an exercise movement  
6 simultaneously moves the user support frame between a start position  
and an end position, the user support pivot mount being positioned such  
8 that portions of the combined weight of the user and user support frame  
are distributed on each side of the gravitational centerline of the pivot  
10 mount in both the start and end position and only a portion of the  
combined weight passes through the gravitational centerline during the  
12 exercise movement.

2 16. The machine as claimed in claim 15, wherein the user support has a  
seat pad and a back pad, and the pivot mount is located beneath the seat  
pad.

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6 17. The machine as claimed in claim 1, wherein the exercise arm  
comprises a single rigid exercise arm having opposite arm portions  
extending on opposite sides of the user support, the handles comprising  
8 angled outer end portions of said arm portions.

2 18. The machine as claimed in claim 1, wherein said handles are  
adjustably mounted for adjusting the spacing between the handles.

2 19. The machine as claimed in claim 1, wherein said handles have  
relatively angled gripping portions for providing multiple hand grip  
positions.

2 20. The machine as claimed in claim 1, wherein a pair of independently  
movable exercise arms are movably mounted on the frame, each exercise  
arm having a handle for engagement by a respective one of the user's  
4 hands.

2 21. The machine as claimed in claim 1, wherein the connecting link is a  
rigid link.

2 22. The machine as claimed in claim 21, wherein the connecting link has  
a first end pivoted to said exercise arm and a second end pivoted to said  
user support frame.

23. The machine as claimed in claim 22, wherein the user support has a  
2 seat portion and a backrest portion, and the second end of the connecting  
link is pivoted to said backrest portion.

24. The machine as claimed in claim 22, wherein the first end of the  
2 connecting link is pivoted to the exercise arm at a location higher than the  
pivot of the second end of the connecting link to the user support.

25. The machine as claimed in claim 22, wherein the first end of the  
2 connecting link is pivoted to the exercise arm at a location lower than the  
pivot of the second end of the connecting link to the user support.

26. The machine as claimed in claim 1, wherein the connecting link is  
2 adjustable in length.

27. The machine as claimed in claim 1, including a slide member slidably  
2 mounted on said user support, the connecting link having a first end  
pivoted to said slide member and a second end pivoted to said exercise  
4 arm.

28. The machine as claimed in claim 1, wherein the connecting link  
2 comprises a first gear toothed cam mounted on said exercise arm, and a  
second gear toothed cam mounted on said user support and meshing with  
4 said first gear toothed cam so as to link movement of said exercise arm  
with movement of said user support.

29. The machine as claimed in claim 1, wherein the connecting link  
2 comprises a wedge member movably engaged with said main frame and

4 user support, and said exercise arm is linked to said moving wedge  
member.

2 30. The machine as claimed in claim 1, wherein the connecting link  
comprises a cable and pulley linkage.

2 31. The machine as claimed in claim 1, wherein the connecting link  
comprises a slide member slidably mounted on said main frame, a first  
linkage connecting said slide member to said user support, and a second  
4 linkage connecting said slide member to said exercise arm.

2 32. The machine as claimed in claim 1, wherein the connecting link  
comprises a multiple bar linkage system between said user support,  
exercise arm, and the user support pivot mount on said main frame.

2 33. The machine as claimed in claim 1, wherein the user support has a  
seat portion and a back rest portion, the multiple bar linkage system  
comprising a first link pivotally connecting a first location on the user  
4 support pivot mount to the back rest portion of the user support, a second  
link pivotally connecting a second location on the user support pivot  
6 mount to the seat portion of the user support, the first location being  
spaced upwardly from said second location, and a third link pivotally  
8 connecting said exercise arm to said main frame, said third link also being  
pivotally connected to said second link.

2 34. The machine as claimed in claim 1, further comprising a round cam  
rotatably mounted on said user support pivot mount, the user support  
being secured to said round cam, wherein said round cam comprises a  
4 pivot connection between the pivot mount and user support.

35. The machine as claimed in claim 34, wherein the connecting link  
6 comprises a cable and pulley linkage between said exercise arm and said  
round cam.

36. The machine as claimed in claim 34, wherein the round cam  
2 comprises a double cam having a first, large diameter portion and a  
second, smaller diameter portion, the user support being mounted on the  
4 first portion of the double cam.

37. The machine as claimed in claim 36, wherein the connecting link  
2 comprises a connection between said exercise arm and the second portion  
of said double cam.

38. The machine as claimed in claim 36, wherein the load is connected to  
2 the first portion of said double cam.

39. The machine as claimed in claim 1, wherein the load comprises a  
2 selectorized weight stack.

40. The machine as claimed in claim 1, wherein the load comprises  
2 weight plates.

41. The machine as claimed in claim 1, wherein the load is linked to said  
2 user support frame.

42. The machine as claimed in claim 1, wherein the load is linked to said  
2 exercise arm.

2 43. The machine as claimed in claim 1, wherein the load is linked to said connecting link.

2 44. The machine as claimed in claim 1, wherein the main frame has a base having a forward end and a rear end, and a rear upright at the rear end of the base, the exercise arm being movably mounted on said rear upright and having arm portions projecting forward on opposite sides of said user support.

2 45. A triceps dip exercise machine for performing exercises equivalent to a free bar dip exercise, comprising:

- 4 a main frame having a forward end and a rear end;
- 4 a user support pivot mount on the main frame;
- 6 a user support frame pivotally mounted on the user support pivot mount, the user support frame comprising one moving part of the machine, and having a seat portion and a back rest portion;
- 8 at least one exercise arm movably mounted on one of the frames for engagement by the user in performing exercises, the exercise arm
- 10 having at least one handle, and comprising a second moving part of the machine;
- 12 a connecting link movably engaged with at least two of the main frame, user support frame and exercise arm for linking movement of the
- 14 exercise arm to movement of the user support frame, the connecting link comprising a third moving part of the machine;
- 16 a load for resisting movement of at least one of the moving parts of the machine;
- 18 whereby movement of the handle in an exercise movement to move the exercise arm from a start position to an end position simultaneously
- 20 moves the user support frame between a start position and an end



22 position, the back rest portion being fixed in position relative to the seat  
portion throughout the exercise movement; and

24 whereby the combined motion of the user support frame and  
exercise arm between the start and end position substantially replicates  
the natural movement of the human body when performing a free bar  
26 triceps dip exercise.

28 46. The machine as claimed in claim 45, wherein the exercise arm and  
user support frame are positioned relative to one another in the start  
30 position such that the handle is located below the shoulders of a user  
seated in the user support frame, and are positioned relative to one  
32 another in the end position such that the handle is located directly below  
the hips of the user seated the user support frame and in line with the  
34 side centerline of the user, whereby the user's arms extend straight down  
and in line with the side centerline of their body in the exercise end  
36 position.

47. The machine as claimed in claim 45, wherein the exercise arm has  
2 opposite arm portions extending on opposite sides of the user support  
frame and a handle at the end of each arm portion.

48. The machine as claimed in claim 45, comprising two separate,  
2 independent exercise arms movably mounted on the main frame to extend  
on opposite sides of the user support frame, each exercise arm having a  
4 handle for gripping by a user.

49. The machine as claimed in claim 45, wherein the user support frame  
2 has a foot rest for supporting the feet of a user seated on the user  
support frame.

4 50. The machine as claimed in claim 49, wherein the foot rest is fixed in  
position relative to the seat portion and back rest portion throughout the  
6 exercise movement.

51. The machine as claimed in claim 45, further comprising a foot rest  
2 mounted on the main frame in front of the user support frame for  
supporting the user's feet during an exercise movement.

52. The machine as claimed in claim 45, wherein the pivot mount is  
2 located beneath the seat portion of the user support frame.

53. The machine as claimed in claim 45, wherein the pivot mount is  
located behind the back rest portion of the user support frame.

2 54. The machine as claimed in claim 53, wherein the back rest portion of  
the user support frame has an upper end, and the pivot mount is pivotally  
4 connected to the upper end of the back rest portion.